SECTION 08 7100

DOOR HARDWARE

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LANL MASTER SPECIFICATION

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the ESM Architectural POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within “stars” during editing.

Specification developed for ML-3 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hardware for [wood] [hollow steel] [aluminum] [ ] doors.

B. Thresholds

C. Gaskets and Edge Seals

1.2 LANL FURNISHED AND INSTALLED EQUIPMENT

A. Permanent lock cylinder cores and keying.

1.3 RELATED SECTIONS

A. Section 08 1213, “Hollow Metal Frames”, for silencers integral with hollow metal frames and for door and frame reinforcements for surface-mounted hardware.

B. Section 08 1400, “Wood Doors”, for factory pre-fitting, factory pre-machining of doors for door hardware, and door reinforcements for surface-mounted hardware.

C. Section [Replaced with 28 3100 Fire Detection and Alarm] [28 3110 Fire Detection and Alarm (additions to existing], Electrical connection to activate door closers.

D. Section 28 1321, “Administrative Access Control System Rough-in”, Electrical connection to activate door locks.

1.4 REFERENCES

A. The following documents, including others referenced therein, form part of this Specification to the extent designated herein:

1. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

   a. NFPA 80 - Standard for Fire Doors and Windows

   b. NFPA 101 - Life Safety Code, Chapter 5.

2. AMERICAN NATIONAL STANDARDS INSITIUTE/COUNCIL OF AMERICAN BUILDING OFFICIALS (ANSI/CABO).

   a. ANSI/CABO A 117.7Standard for Accessible and Usable Buildings and Facilities.

3. AMERICAN NATIONAL STANDARDS INSTITUTE/BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (ANSI/BHMA).

   a. ANSI A115 Series — Preparation of Door Hardware for Installation
   b. ANSI/BHMA A156.1 — Butts and Hinges
   c. ANSI/BHMA A156.2 — Bored and Preassembled Locks and Hatches
   d. ANSI/BHMA A156.3 — Exit Devices
   e. ANSI/BHMA A156.4 — Door Controls - Closers
   f. ANSI/BHMA A156.5 — Auxiliary Locks and Associated Products
   g. ANSI/BHMA A156.6 — Architectural Door Trim
   h. ANSI/BHMA A156.7 — Template Hinge Dimensions
   i. ANSI/BHMA A156.8 — Door Controls - Overhead stops and Holders
   j. ANSI/BHMA A156.12 — Interconnected Locks and Latches
   k. ANSI/BHMA A156.13 — Mortise Locks and Latches
   l. ANSI/BHMA A156.15 — Release Devices – Closer Holder
   m. ANSI/BHMA A156.16 — Auxiliary Hardware
   n. ANSI/BHMA A156.18 — Materials and Finishes
   o. ANSI/BHMA A156.19 — Power Assist and Low Energy Power Operated Doors
   p. ANSI/BHMA A156.21 — Thresholds
   q. ANSI/BHMA A156.22 — Door Gasketing and Edge Seal Systems
   r. ANSI/BHMA A156.31 — Electric Strikes and Frame Mounted Actuators

4. DOOR AND HARDWARE INSTITUTE (DHI)

    a. DHI Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.

    b. DHI Recommended Locations for Architectural Hardware for Flush Wood Doors.

5. UNDERWRITERS LABORATORIES (UL)

1.5 SUBMITTALS

A. Submit the following in accordance with Section 01 3300, Submittal Procedures:

1. Catalog data for each item of hardware. Include whatever information may be necessary to show compliance with the specified requirements, and include instructions for installation and for maintenance of operating parts and finish.

2. Materials list in the form of a final hardware schedule in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.

3. Final Hardware Schedule: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:

    a. Type, style, function, size and finish of each hardware item.

    b. Name and manufacturer of each item.

    c. Fastenings and other pertinent information.

    d. Location of hardware set cross-referenced to indications on Drawings.

    e. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.

    f. Mounting locations for hardware.

    g. Keying information.

4. Submittal Sequence: Submit hardware schedule at earliest possible date, particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames). Include with hardware schedule, the project data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule. If door has access control, S-3 and CTN-4 must review for approval.

5. Provide 5-year warranty on materials and installation workmanship on specified door hardware under this Section. Repair or replace all failed items.

6. Provide manufacturer’s standard materials and workmanship 2-year warranty for electromechanical door operators.

7. Furnish a complete set of specialized tools and maintenance instructions as needed for LANL's continued adjustment, maintenance, removal and replacement of finish hardware.

1.6 COORDINATION

A. Supply templates to manufacturers for door and frame preparation.

1.7 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with provisions contained in the above referenced nationally-accepted Codes and Standards, unless otherwise specified herein.

B. Single Source Responsibility: Obtain each type of hardware (locksets, hinges, closers, etc.) from a single manufacturer specializing in the manufacture of that hardware type

C. Supplier Qualifications: Obtain hardware from a recognized architectural hardware supplier that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project.

D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA 80, NFPA 101 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, or FM, for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and frame labels.

1.8 PRODUCT HANDLING

A. Tag or package each item separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable, so that completion of the Work will not be delayed by hardware losses, both before and after installation.

PART 2 PRODUCTS

2.1 GENERAL

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this Section. Products are identified by ANSI/BHMA 156 Series hardware designation numbers.

2.2 MATERIALS AND FABRICATION

A. General:

1. Drawings show direction of swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

2. Do not use manufacturer's products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required UL labels and approved by LANL.

3. Produce hardware units of basic metal and forming method indicated, using the manufacturer's standard metal alloy, composition, temper and hardness. Construction of hardware units must conform to applicable ANSI A156 series standards for each type hardware item and finish designation indicated. Do not furnish "optional" materials or forming methods for those indicated, unless specified otherwise.

4. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws.

5. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws unless otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish, or if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.

6. Provide concealed fasteners for hardware units that are exposed when door is closed, unless no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex bolt fasteners.

2.3 HINGES AND BUTTS

A. Templates: Provide only template-produced units, except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames.

B. Provide butts of five knuckle; ball bearing type.

C. Screws: Use Phillips flat-head or machine screws for installation of units, except use Phillips flat-head or wood screws for installation of units into wood. Finish of screw heads shall match surface of hinges or pivots.

D. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

1. Steel Hinges: Steel pins.

2. Non-ferrous Hinges: Stainless steel pins.

3. Exterior Doors: Non-removable pins.

4. Out-swing Corridor Doors: Non-removable pins.

5. Interior Doors: Non-rising pins.

6. Tips: Flat button and matching plug, finished to match leaves.

7. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf for doors 90 inches or less in height and one additional hinge for each 30 inches of additional height or fraction thereof.

2.4 LOCK CORES AND KEYING

A. Manufacturer: Best Access Systems, subsidiary of Stanley. Alternate Manufacturers or products will not be accepted.

B. Cores: Provide number 1C7G1, 7-pin interchangeable core inserts for each type of lockset/exit device included under Section 3.4, Hardware Schedule.

C. Keying: Furnish lockset cylinders with cores for use during construction. Provide keys as required to control access during the construction period. Prior to final transfer, provide 2 control keys to LANL for use when installing permanent lockset cores. Permanent cores and keying will be furnished and installed by LANL.

2.5 LOCKS, LATCHES AND BOLTS

A. Mechanical Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.

1. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.

2. Provide roller type strikes where recommended by manufacturer of the latch and lock units.

B. Electric Strikes:

1. Comply with BHMA Std. 501, Grade 1 requirements and UL 1034, Burglary-Resistant Electric Locking Mechanisms. [At fire-rated openings provide UL listed Fire Door Accessory, category 10B, for use with 3 hour “A” labeled doors.] (NOTE: At fire-rated openings, specify only FAIL-SECURE strikes.)

2. Acceptable Manufacturers:

a. Adams Rite Manufacturing Company

b. Folger Adam Security Inc.

c. Hanchett Entry Systems, Inc.

d. Von Duprin

3. Provide Electric strikes that are compatible with types and models of locksets or exit devices being installed. Electric strikes shall be as indicated in Section 3.4, Hardware Schedule, of this specification.

4. Provide solenoid actuated, heavy-duty, tamper-resistant electric strikes constructed of corrosion-resistant metals, with stainless steel cases and springs.

5. Electric strikes shall be non-handed, field-reversible, and horizontally adjustable to compensate for door/frame misalignment.

6. Electric strike function shall be [Fail-Secure (unlocked when energized)] [Fail-Safe (locked when energized)], with [12] [24] VDC solenoid operating voltage.

7. Electric strikes shall accommodate internal switches for remote monitoring and control as required.

8. Provide electric strikes with compatible transformers and rectifiers as required to complete the system for voltages specified. Electrical accessories shall be provided by the strike manufacturer.

9. Finish: Hardware finish code number 630 (US 32D), satin stainless steel, per ANSI A156.18.

C. Lock Throw: Provide 5/8-inch minimum throw of latch and deadbolt used on pairs of doors. [Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.]

D. Flush Bolt: Provide minimum l/2 inch diameter rods of brass, bronze or stainless steel, with minimum 12 inch long rod for doors up to 7 feet in height. Provide longer rods as necessary for doors exceeding 7 feet in height.

E. Mortise Type Locks and Latches:

1. Conform to ANSI A156.13, Series 1000, Operational Grade 1, Security Grade 2, and be UL listed for use on 3-Hour A label doors.

2. Manufacturer: Best Access Systems, subsidiary of Stanley. Alternate Manufacturers or products will not be accepted.

3. Provide 35H Series, heavy-duty mortise locksets with levers and trim items as specified. Function to be per Section 3.4, Hardware Schedule. Provide lockset with type 1E74 cylinder housing that accepts interchangeable 7-pin core as specified in Section 2.4. (NOTE: 35 Series mortise locksets are being upgraded by Best and will become 45 Series this spring. Numbers for Trim items, levers, etc. will remain as shown)

4. Levers: Provide Style 3, solid tube with return levers, complying with Accessibility requirements. Provide levers at entrances into hazardous areas (i.e. electrical rooms) with a tactile (TL style) or knurled (KNL style) finish.

5. Trim: Provide Style [H, 2-9/16” diameter flat rose] [J, wrought escutcheon plate] to match mortise lockset configuration.

6. Finish: Hardware finish code number 625 (US 26), bright chromium plated, per ANSI A156.18.

7. Provide mortise locksets that fit ANSI A115.1 door preparation.

F. Cylindrical Type Locksets:

1. Conform to ANSI A156.2, Series 4000, Grade 1, and provide UL listing for use on 3-Hour A label single swinging doors.

2. Manufacturer: Best Access Systems, subsidiary of Stanley. Alternate Manufacturers or products will not be accepted.

3. Provide 93K Series, extra heavy-duty cylindrical locksets with levers and trim Items as specified. Function to be per Section 3.4, Hardware Schedule. Provide lockset with interchangeable 7-pin core as specified in Section 2.4.

4. Levers: Provide Style 14, curved return levers, complying with Accessibility requirements. Provide levers at entrances to hazardous areas (i.e. electrical rooms) with a tactile (TL style) finish.

5. Trim: Provide Style D, 3-1/2" convex rose to match lever.

6. Finish: Hardware finish code number 625 (US26), bright chromium plated, per ANSI A156.18.

7. Provide cylindrical locksets that fit ANSI A115.2 door preparation as modified to meet additional manufacturer recommendations.

2.6 EXIT DEVICES

A. Conform to ANSI A156.3, Grade l. [Provide exit devices at fire-rated openings complying with requirements of NFPA 80 and NFPA 101.]

B. Acceptable Manufacturer: Von Duprin.

C. [Flush and Wide Stile Doors]

1. Provide Series [98] [99] touchbar type [panic rated] [fire rated], [rim] [surface vertical rod] [concealed vertical rod] exit devices as identified in Section 3.4, Hardware Schedule. Do not use EL33,EL35, EL98, or EL99 crash bars. Use E996C trim for series 98/99. Use E360L-BE trim on series 33/35.

D. [Narrow Stile Doors]

1. Provide Series [33A] [35A] touchbar type [panic rated] [fire rated], [rim] [surface vertical rod] [concealed vertical rod] exit devices as identified in, Hardware Schedule. Do not use EL33,EL35, El98, or EL99 crash bars. Use E360L-BE trim on one door.

E. Where closers are installed on doors equipped with exit devices, provide exit devices with keyed dogging to hold push bar down and latch bolt in the retracted

position. Provide devices with field convertible hex key dogging to high security cylinder dog operation.

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[Delete paragraph E. when fire-rated assemblies are specified]

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F. Provide non-handed exit devices and capable of direct field conversion for all available trim functions.

G. Provide exit devices with hydraulic sound dampers.

H. All working parts to be made of stamped steel.

I. Latch bolts to be self-lubricating to reduce friction and wear.

J. All rim and vertical rod exit devices to be capable of electric trim activation. Provide Manufacturer's available accessory products, including power supplies, monitoring switches and controls to complete the system. All components to be UL listed.

K. Trim: Provide exit device trim as indicated in Section 3.4, Hardware Schedule. Trim to accept 7 pin interchangeable cores as specified in Section 2.4.

L. Finish: Hardware finish code number [625 (US26), bright chromium plated] [626 (US26D), satin chromium plated], per ANSI A156.18.

2.7 OPERATORS, CLOSERS AND DOOR CONTROL DEVICES

A. Powered Door Operators

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[NOTE: When specifying powered door operators, the Architect shall incorporate LANL CCN-4 Organization design requirements to coordinate and ensure operator, card readers, actuators, and electric strike functionality.]

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1. Comply with requirements of ANSI A156.19 and the ADA. Provide UL listed operators per UL 325 for self-closing doors [and for use at fire-rated openings.]

2. Acceptable Manufacturers:

   a. LCN Closers, an Ingersoll-Rand Business

   b. Dorma Architectural Hardware

3. Operators to be surface mount [push] [pull] [double egress] low energy electromechanical units complete with controls and actuators.

4. Operator opening force, time delay, and the opening, closing and back check speeds be individually adjustable.

5. Operators to include a vestibule function for sequencing operation of two units.

6. Operators to have on/off strike switch to delay operation while locking device releases.

7. Provide operators with a Push & Go feature to activate low energy or power assist with the door.

8. Provide operator with a safety feature that reverses the direction of door travel if it contacts an object during either opening or closing.

9. Provide operators with a power boost feature to increase latching force to ensure secure latching in severe wind or stack conditions.

10. Operator power supply to provide [12VDC] [24 VDC] outputs to power card readers, electric locking devices, and other peripherals.

11. Actuators to be hardwired [12VDC] [24VDC] round [4-1/2 inch] [6 inch] diameter stainless steel touch plates with engraved blue-filled handicapped symbol. Actuators to be installed in manufacturer's standard flush or surface mounting boxes to be located on a vertical surface near controlled door.

12. Finish: Manufacturer's standard sprayed or anodized aluminum (BHMA No. 689) or dark bronze (BHMA No. 695).

B. Door Closers

1. Conform to ANSI 156.4, [Type C02011, hinge-side mounting, for interior and exterior in-swinging doors] [Type CO2021, parallel arm mounting, for exterior and corridor out-swinging doors]. Closers to be surface type with modern [full] [slim line] covers.

2. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit depending upon size of door, exposure to weather and anticipated frequency of use. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.

3. Access-free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing.

4. Closer Finish: Select manufacturers' standard powder-coated or painted finish to match other hardware installed at opening.

C. Door Stops

1. Conform to ANSI A156.16. Stops shall be BHMA L42101, L42251, L12141 or L12161, as applicable. Provide gray resilient parts for exposed bumpers.

2.8 DOOR TRIM UNITS

A. Fasteners: Provide manufacturer's standard exposed fasteners, either machine screws or self-tapping screws, for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units).

B. Fabricate edge trim items of anodized aluminum, in length of not more than 1/2 inch nor less than 1/16 inch smaller than door dimension.

C. Fabricate kickplates not more than 1-1/2 inches less than door width and 12 inches high. Kickplates shall conform to ANSI 156.5, Type J102. Plates shall be a minimum of 0.050 inch thick stainless steel with finish to be US 32.

2.9 DOOR SEALS AND GASKETS

A. Manufacturer: National Guard Products, Inc.

B. Provide self-adhesive [intumescent] [neoprene] [silicone] products complying with ANSI A156.22. Provide [seals] [gaskets] for [20] [45] [60] [90] minute rated [insert door size] perimeter, [single swing] [standard pair] [double egress] doors.

C. Fire Gasketing

1. [Hollow Metal fire doors rated up to 3 hours/Wood fire doors rated up to 1-1/2 hours].

   a. UL 10B Classified, complying with NFPA 252.

2. [IBC Positive Pressure Hollow Metal fire doors rated up to 3 Hours/Wood fire doors rated up to 1-1/2 Hours].

   a. UL 10C Classified, complying with IBC Positive Pressure requirements.

   b. Category “J” listed.

D. Smoke Gasketing

1. Edge Sealing System

   a. [Required for Category “B” listed Wood fire doors to meet IBC Positive Pressure requirements].

   b. Category “G” listed.

2. Smoke and Draft Control Gasketing

   a. [For use on all “S” labeled IBC Positive Pressure doors]

   b. Category “H” listed.

   c. Comply with UL 1784, NFPA 105 and IBC Positive Pressure requirements.

3. Combination Edge Sealing System and Smoke Draft Control Gasketing.

   a. [Required for Category “B” Listed Wood fire doors to meet Positive Pressure and “S” Label requirements].

b. Category “G” and “H” Listed.

c. Acoustical Gasketing.

d. [Can be used on Positive Pressure assemblies].

e. Category “J” listed.

f. Tested to ASTM E90 and ASTM E413.

g. Automatic Door Bottoms and Thresholds.

4. Smoke Assembly: [Any UL10C classified threshold, automatic door bottom, door sweep or door shoe may be installed (although not required) on an “S” label door without affecting the label.]

5. Acoustical Assembly: Provide automatic door bottoms and compatible thresholds as tested to ASTM E90 and ASTM E413.

2.10 WEATHERSTRIPPING

A. General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide non-corrosive fasteners as recommended by manufacturer for application indicated. Provide weatherstripping with manufacturer’s standard clear or bronze anodized finish.

B. Replaceable Seal Strips: Provide only units for which resilient seal is easily replaceable and readily available from stocks maintained by manufacturer.

2.11 THRESHOLDS

A. General: Except as otherwise indicated, provide standard metal threshold unit of type, size and profile as scheduled. Threshold finish shall be manufacturer’s standard mill finish aluminum.

2.12 HARDWARE FINISHES

A. Provide matching finishes for hardware units at each door or opening, except as otherwise specified. Reduce differences in color and textures as much as commercially possible where base metal or metal forming process is different for individual units of hardware at the same opening.

B. Provide finishes which match those established by BHMA.

C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.

D. Designations used in schedules and elsewhere to indicate hardware finishes are as listed in ANSI A156.18 "Materials & Finishes Standard", including coordination with traditional U.S. finishes shown by certain manufacturers for their products.

E. Unless otherwise specified, acceptable hardware finishes include BHMA No. 625 (US26D), satin chromium plated; No. 625 (US26), bright chromium plated; and No. 629 (US32), bright stainless steel.

PART 3 EXECUTION

3.1 INSPECTION

A. Verify that doors and frames are ready to receive hardware and that dimensions are as [indicated on shop drawings.], [instructed by the manufacturer.]

B. Verify that power supply is available to power operated devices.

END OF SECTION

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Do not delete the following reference information:
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FOR LANL USE ONLY

This project specification is based on LANL Master Specification 08 7100, Rev. 1, dated April 13, 2006.